

SEQUENCE LISTING

<110> Kimoto, Norihiro
Yamamoto, Hiroaki

<120> ALPHA-KETO ACID REDUCTASE, METHOD FOR PRODUCING THE SAME, AND
METHOD FOR PRODUCING OPTICALLY ACTIVE ALPHA-HYDROXY ACIDS USING THE
SAME

<130> SHZ-015

<140>
<141>

<150> JP 2002-207507
<151> 2002-07-16

<160> 15

<170> PatentIn Ver. 2.1

<210> 1

<211> 954

<212> DNA

<213> *Leuconostoc mesenteroides*

<220>

<221> CDS

<222> (1)..(954)

<400> 1

```

atg aaa ata gct att gca gga ttt ggt gca ctt ggt gca cga tta ggt 48
Met Lys Ile Ala Ile Ala Gly Phe Gly Ala Leu Gly Ala Arg Leu Gly
   1           5           10          15

```

gtc atg ctc cag gct ggt ggc cat gag gtt acc ggg att gat ggt tgg 96
 Val Met Leu Gln Ala Gly Gly His Glu Val Thr Gly Ile Asp Gly Trp
 20 25 30

ccg gca cat att gct gct att aat aca aaa ggt tta aca gtc gtt aaa 144
 Pro Ala His Ile Ala Ala Ile Asn Thr Lys Gly Leu Thr Val Val Lys
 35 40 45

gat aat gat gca cca caa aag tat ttt gta cca gtt atg ccg gca agt 192
Asp Asn Asp Ala Pro Gln Lys Tyr Phe Val Pro Val Met Pro Ala Ser
50 55 60

```

gaa gtg aca ggc aca ttt gat tta att att tta ctc act aaa aca cca 240
Glu Val Thr Gly Thr Phe Asp Leu Ile Ile Leu Leu Thr Lys Thr Pro
   65          70          75          80

```

caa cta gac gac atg tta aca gat att cag cct att ata acg gat act 288
 Gln Leu Asp Arg Met Leu Thr Asp Ile Gln Pro Ile Ile Thr Asp Thr
 85 90 95

aca aaa tta ttg gta tta tca aac ggt ttg ggt aat att gaa gtg atg 336
Thr Lys Leu Leu Val Ser Asn Gly Leu Gly Asn Ile Glu Val Met
100 105 110

gca aag cac gtg tca cgc cat caa att ttg gct ggt gtc aca tta tgg 384
Ala Lys His Val Ser Arg His Gln Ile Leu Ala Gly Val Thr Leu Trp

115	120	125	
aca tcg tca cta ata aag cca ggt gaa ata cat gtt act ggt agt ggc Thr Ser Ser Leu Ile Lys Pro Gly Glu Ile His Val Thr Gly Ser Gly			432
130	135	140	
tct att aaa tta caa gca att ggc gat gct gtc caa agt ata gcg Ser Ile Lys Leu Gln Ala Ile Gly Asp Ala Asp Val Gln Ser Ile Ala			480
145	150	155	160
gat gct ttg aat cag gct ggc tta aac gcc gaa att acc cca gat gtg Asp Ala Leu Asn Gln Ala Gly Leu Asn Ala Glu Ile Thr Pro Asp Val			528
165	170	175	
atg aca gca att tgg cat aag gca ggt atc aac gcg gtg ctc aat cct Met Thr Ala Ile Trp His Lys Ala Gly Ile Asn Ala Val Leu Asn Pro			576
180	185	190	
tta tcc gtg ttg tta aat gca aat att gct gaa ttt ggc aca gct ggc Leu Ser Val Leu Leu Asn Ala Asn Ile Ala Glu Phe Gly Thr Ala Gly			624
195	200	205	
aat gcc atg gat cta gca ttg aat att cta gat gag atg aag caa gtt Asn Ala Met Asp Leu Ala Leu Asn Ile Leu Asp Glu Met Lys Gln Val			672
210	215	220	
ggt gcg tca caa ggc att aaa gtt gac gtt agt ggt att atg acg gac Gly Ala Ser Gln Gly Ile Lys Val Asp Val Ser Gly Ile Met Thr Asp			720
225	230	235	240
ttg agt cag tta ctt aaa cca gaa aat gca ggt aat cat ttt ccg tca Leu Ser Gln Leu Leu Lys Pro Glu Asn Ala Gly Asn His Phe Pro Ser			768
245	250	255	
atg tac caa gat att caa aat ggt aaa cgt act gaa att gat ttc ttg Met Tyr Gln Asp Ile Gln Asn Gly Lys Arg Thr Glu Ile Asp Phe Leu			816
260	265	270	
aat ggt tac ttt gcc aag ata gga cac gaa tct ggc att ccg acc cct Asn Gly Tyr Phe Ala Lys Ile Gly His Glu Ser Gly Ile Pro Thr Pro			864
275	280	285	
ttc aat gcc tta gtg aca cggt tta att cat gct aag gaa gat att gaa Phe Asn Ala Leu Val Thr Arg Leu Ile His Ala Lys Glu Asp Ile Glu			912
290	295	300	
cgt gtt aaa tta gca aaa cag caa gaa aac ttt gaa att tga Arg Val Lys Leu Ala Lys Gln Gln Glu Asn Phe Glu Ile			954
305	310	315	
 <210> 2 <211> 317 <212> PRT <213> Leuconostoc mesenteroides			
 <400> 2 Met Lys Ile Ala Ile Ala Gly Phe Gly Ala Leu Gly Ala Arg Leu Gly 1 5 10 15 Val Met Leu Gln Ala Gly Gly His Glu Val Thr Gly Ile Asp Gly Trp 20 25 30			

Pro Ala His Ile Ala Ala Ile Asn Thr Lys Gly Leu Thr Val Val Lys
 35 40 45
 Asp Asn Asp Ala Pro Gln Lys Tyr Phe Val Pro Val Met Pro Ala Ser
 50 55 60
 Glu Val Thr Gly Thr Phe Asp Leu Ile Leu Leu Thr Lys Thr Pro
 65 70 75 80
 Gln Leu Asp Arg Met Leu Thr Asp Ile Gln Pro Ile Ile Thr Asp Thr
 85 90 95
 Thr Lys Leu Leu Val Leu Ser Asn Gly Leu Gly Asn Ile Glu Val Met
 100 105 110
 Ala Lys His Val Ser Arg His Gln Ile Leu Ala Gly Val Thr Leu Trp
 115 120 125
 Thr Ser Ser Leu Ile Lys Pro Gly Glu Ile His Val Thr Gly Ser Gly
 130 135 140
 Ser Ile Lys Leu Gln Ala Ile Gly Asp Ala Asp Val Gln Ser Ile Ala
 145 150 155 160
 Asp Ala Leu Asn Gln Ala Gly Leu Asn Ala Glu Ile Thr Pro Asp Val
 165 170 175
 Met Thr Ala Ile Trp His Lys Ala Gly Ile Asn Ala Val Leu Asn Pro
 180 185 190
 Leu Ser Val Leu Leu Asn Ala Asn Ile Ala Glu Phe Gly Thr Ala Gly
 195 200 205

 Asn Ala Met Asp Leu Ala Leu Asn Ile Leu Asp Glu Met Lys Gln Val
 210 215 220
 Gly Ala Ser Gln Gly Ile Lys Val Asp Val Ser Gly Ile Met Thr Asp
 225 230 235 240
 Leu Ser Gln Leu Leu Lys Pro Glu Asn Ala Gly Asn His Phe Pro Ser
 245 250 255
 Met Tyr Gln Asp Ile Gln Asn Gly Lys Arg Thr Glu Ile Asp Phe Leu
 260 265 270
 Asn Gly Tyr Phe Ala Lys Ile Gly His Glu Ser Gly Ile Pro Thr Pro
 275 280 285
 Phe Asn Ala Leu Val Thr Arg Leu Ile His Ala Lys Glu Asp Ile Glu
 290 295 300
 Arg Val Lys Leu Ala Lys Gln Gln Glu Asn Phe Glu Ile
 305 310 315

<210> 3
 <211> 15
 <212> PRT
 <213> Leuconostoc mesenteroides

<400> 3
 Met Lys Ile Ala Ile Ala Gly Phe Gly Ala Leu Gly Ala Arg Leu
 1 5 10 15

<210> 4
 <211> 10
 <212> PRT
 <213> Leuconostoc mesenteroides

<400> 4
 Leu Gly Val Met Leu Gln Ala Gly Gly His
 1 5 10

<210> 5
 <211> 10

<212> PRT
<213> Leuconostoc mesenteroides

<400> 5
Thr Glu Ile Asp Phe Leu Asn Gly Tyr Phe
1 5 10

<210> 6
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (27)
<223> n indicates any one of a, t, c or g

<400> 6
ctgaagctta tgaarathgc hathgcngg 29

<210> 7
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (30)
<223> n indicates any one of a, t, c or g

<400> 7
cagaagcttt gdcccdcdgc ytgyarcatn ac 32

<210> 8
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<220>
<221> misc_feature
<222> (30)
<223> n indicates any one of a, t, c or g

<400> 8
ctgaagcttg gygthatgyt dcargchgggn gg 32

<210> 9
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 9
gtcaagcttt adccrtyar raartcdaty tc 32

<210> 10
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 10
ctgaagctta chgaratyga yttyytdaay gg 32

<210> 11
<211> 785
<212> DNA
<213> Leuconostoc mesenteroides

<400> 11
ggatttgggt cacttggtgc acgatttagt gtcatgctcc aggctggtgg ccatgaggtt 60
accgggattt atggttggcc ggcacatatt gctgtatta atacaaaagg tttaacagtc 120
gttaaagata atgatgcacc acaaaaagtat tttgtaccag ttatgccggc aagtgaagtg 180
acaggcacat ttgatttaat tattttactc actaaaaacac cacaactaga ccgcatttta 240
acagatattt acgcatttat aacggatact acaaaaattt tggatttttc aaacggttt 300
ggttaatattt aagtgtatggc aaagcacgtg tcacgcattt aaattttggc tgggttcaca 360
ttatggacat cgtcactaat aaagccagtt gaaatacatgt ttactggtag tggctctatt 420
aaatttacaag caatttgcga tgctgtatgtc caaagtatag cggatgttt gaatcaggct 480
ggcttaaacc ccgaaattac cccagatgtg atgcacgcaa ttggcataa ggcaggatcc 540
aacgcgggtgc tcaatccccc atccgtgtt ttaaatgcaat atattgtca atttggcaca 600
gctggcaatg ccatgatct agcattgaat attcttagatg agatgaagca agttggtgcg 660
tcacaaggca ttaaaggatca cgttagtggt attatgacgg acttgagtca gttaactaaa 720
ccagaaaatg caggtaatca tttccgtca atgtaccaag atattcaaaa tggtaaacgt 780
actga 785

<210> 12
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 12
tcacttgcgg gcataactgg 20

<210> 13
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 13 23
gtcacaaggc attaaagttg acg

<210> 14
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 14 44
gtcgaattct atcatgaaaa ttgcaattgc aggatttggc gcac

<210> 15
<211> 58
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:Artificially
Synthesized Sequence

<400> 15 58
gataagctta ctagtattaa atttcaaagt tttcttgctg ttttgctaatttaacacg